

bers 10, 20 are prepared in the first sub-chamber 101 or before transferring the joining stack to the first sub-chamber 101. The arrangement may be fully assembled in the second sub-chamber 102. The joining process may then be performed in the second sub-chamber 102. Afterwards, the foil stack may be transferred back to the third sub-chamber 103, while the joining members 10, 20 are transferred back to the first sub-chamber 101 for further processing (e.g., cooling). That is, in the example illustrated in FIG. 13, creating the defined atmosphere and cooling down of the joining stack may take place in the same sub-chamber (e.g., first sub-chamber 101), in contrast to what has been described with respect to FIGS. 11 and 12.

[0050] According to one example, the foils are provided on reels/rolls and pieces of foils may be cut off the reels/rolls before assembling the foils on the first carrier element 60. According to one example, each of the foils may be provided on a separate reel. However, it is also possible to provide a ribbon of stacked foils on a single reel. A robotic unit may pick up the cut ribbon and, if necessary, assemble the foil stack on the first carrier element 60. Another robotic unit (transportation unit) may then transfer the first carrier element 60 with the foil stack arranged thereon to the process chamber. An even further robotic unit may transfer the joining stack to the process chamber. The whole assembly of the arrangement, therefore, may be implemented automatic and therefore comparably fast and cost effective. A carrier may be arranged next to the process chamber. For example, a plurality of support frames with joining members arranged thereon may be inserted in the carrier. The respective robotic unit may grasp one of the support frames and place it inside the process chamber. After performing the joining process, the support frame may be transferred back to the carrier and the next support frame may be arranged inside the process chamber. Each of the robotic units may comprise a vacuum unit that is configured to picking up elements by generating a vacuum. The assembly process may comprise pick and place processes.

[0051] In an exemplary production line, the joining members 10, 20 may enter the production line at a loader. In a next chamber (cleaning module), the joining members 10, 20 may be cleaned. In a subsequent assembly chamber (sinter stack module), the joining members 10, 20 may be arranged on a support frame. According to one example, more than one joining stack is arranged on each support frame. The support frame with the joining members 10, 20 arranged thereon is then transferred to a process chamber (sinter press module). The foil stack may be arranged above the joining stack in the assembly chamber, for example, and may enter the process chamber together with the joining stack. After forming the connection between the joining members 10, 20, the whole arrangement may be transferred to a cooling chamber (cooling module). The foil stack, however, may be transferred back from the cooling chamber to the assembly chamber for reuse. After cooling the joining members, the support frame may be unloaded. That is, the now connected joining members may be removed from the support frame. The support frame may be reused. The same applies for the first carrier element, which may also be reused. Only the foils need to be replaced after one or more subsequent processes.

[0052] Although specific embodiments have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that a variety of alternate and/or

equivalent implementations may be substituted for the specific embodiments shown and described without departing from the scope of the present invention. This application is intended to cover any adaptations or variations of the specific embodiments discussed herein. Therefore, it is intended that this invention be limited only by the claims and the equivalents thereof.

What is claimed is:

1. An arrangement for joining two joining members, comprising:

a first part comprising a support surface;
a first carrier element configured to carry at least one foil;
a transportation unit configured to arrange the first carrier element with the at least one foil arranged thereon in such a way that the at least one foil is arranged above the support surface of the first part in a vertical direction; and

a second part configured to exert pressure to a joining stack, when the joining stack is arranged on the support surface,

wherein the joining stack comprises a first joining member arranged on the support surface, a second joining member, and an electrically conductive connection layer arranged between the first joining member and the second joining member,

wherein when pressure is exerted to the joining stack by the second part, the at least one foil is arranged between the second part and the joining stack and is pressed onto the joining stack and the joining stack is pressed onto the first part, thereby compressing the connection layer and forming a substance-to-substance bond between the first joining member and the second joining member.

2. The arrangement of claim 1, wherein when the at least one foil carried by the first carrier element is arranged above the support surface, and before pressure is exerted to the joining stack by the second part, a first foil of the at least one foil that is arranged closest to the joining stack is arranged at a first distance greater than zero from an uppermost surface of the joining stack.

3. The arrangement of claim 1, wherein the first carrier element comprises a frame with a projection, and wherein when the at least one foil is carried by the first carrier element an edge region of the at least one foil rests on the projection of the frame.

4. The arrangement of claim 1, wherein at least one of the first part and the second part comprises a heating element.

5. The arrangement of claim 1, further comprising a second carrier element configured to carry the joining stack before arranging the joining stack on the support surface of the first part.

6. The arrangement of claim 5, wherein when the at least one foil is arranged above the support surface of the first part, the first carrier element is arranged on the second carrier element.

7. The arrangement of claim 1, wherein when the at least one foil is arranged above the support surface of the first part, the first carrier element is partly arranged above an edge region of the first joining member in the vertical direction.

8. The arrangement of claim 1, wherein the first carrier element comprises fastening or holding means configured to hold the at least one foil in place, when the at least one foil is arranged on the first carrier element.